Name_____Date_____Period____

Kinetic Theory & Boyle's and Charles' Law

Part I: Complete each statement using the terms below. Some terms may be used more than once.

½ mv^2	constant motion	no force
volume	temperature	pressure
energy	elastic	

1. The kinetic molecular theory describes the behavior of gases in terms of _____.
2. The kinetic energy of a particle is represented by the equation _____.
3. _____ is the measure of the average kinetic energy of the particles in a sample of matter.
4. Gas particles are said to be in _____.
5. The collisions between gas particles are _____.
6. Boyle's law relates _____ and _____.
7. Charles' law relates _____ and _____.
8. Gas particles exert _____ on one another.

Part II: True/False.

_____9. Gases are less dense than solids because there is a lot of space between the particles of a gas.

_____10. The random motion of gas particles causes a gas to expand until it fills its container.

_____11. The density of a gas decreases as it is compressed.3

_____12. Pressure is defined as area per unit of force.

_____13. The temperature must always be in Kelvin when solving gas law problems.

Part III: Matching.

_____14. kPa _____15. °C _____16. mL _____17. K _____18. mm Hg _____19. atmospheres (atm) _____20. L _____21. cm^3 _____22. torr	a. pressure b. temperature c. volume

Part IV: For each question below write **increases, decreases, or stays the same**.

_____23. The room temperature increases from 20°C to 24°C. What happens to the volume of helium inside a balloon contained in the room?

_____24. The volume of air in human lungs, increases before it is exhaled. What happens to the temperature of the air in the lungs to cause this change, assuming pressure stays constant?

_____25. A leftover hamburger patty is sealed in a plastic bag and placed in the refrigerator. What happens to the volume of the air in the bag?

_____26. What happens to the volume of a marshmallow if it is placed in a bell jar, and the pressure is decreased?

Part IV: Gas Law Problems.

Fill in the equations for each gas law.

Boyle's Law	Charles' Law

27. A 7.0 liter balloon at room temperature (22°C) contains hydrogen gas. If the balloon is carried outside to where the temperature is -3.0°C, what volume will the gas now occupy?

28. A 5.0 liter tank of oxygen gas is at a pressure of 3 atm. What volume of oxygen will be available if the oxygen is used at standard pressure (1 atm)?

29. A gas at 89°C occupies a volume of 0.67L. At what temperature will the volume increase to 1.12L?

30. The volume of a gas at 99.0 kPa si 300.0 mL. If the pressure is increased to 188kPa, what will be the new volume?